DOCUMENT RESUME

ED 222 320 SE 034 859

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TITLE The Use of the State-Trait Anxiety Inventory in Science Education.
PUB DATE Apr 81
NOTE 8p.; Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (54th, Ellenville, NY, April 5-8, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Anxiety; Elementary Education; *Elementary School Science; Elementary School Teachers; Higher Education; *Measures (Individuals); *Preservice Teacher Education; Science Education; *Science Instruction; Teacher Attitudes; Teacher Characteristics
IDENTIFIERS Science Education Research; *State Trait Anxiety Inventory

ABSTRACT

The A-State form of the State-Trait Anxiety Inventory (STAI) is used to assess transitory emotional states provoked by an individual's perceptions of a specific situation as personally threatening. These experiences produce emotional reactions which characteristically involve STAI was found to be a reliable and easy-to-administer instrument for measuring preservice elementary teachers' anxiety about teaching science. measuring preservice elementary teachers anxiety about teaching science. The instrument has been used to examine: (1) effect of a sequence of science content courses; (2) the relationship with attitude toward teaching science (as measured by the Modified Bratt Attitude Test); (3) effects of various teachers; (4) effects of staffing patterns; (5) relationship among various demographic variables; and (6) the longitudinal effects of subsequent academic experiences. Results indicate that the instrument can measure changes in anxiety about science teaching in specific situations and that it is possible to identify subjects (N=544) who are extremely anxious about teaching science by comparing A-State (transitory) with A-Trait (relatively stable individual differences in anxiety proneness) scores. (Author/JN)

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THE USE OF THE STATE-TRAIT ANXIETY INVENTORY IN SCIENCE EDUCATION

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THE USE OF THE STATE-TRAIT ANXIETY INVENTORY IN SCIENCE EDUCATION

Paper presented at 52th annual meeting of National Association for Research in Science Teaching

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ABSTRACT

The researcher found the State-Trait Anxiety Inventory (STAI) an easy to administer, reliable instrument, useful in science education for the measurement of anxiety about teaching science in preservice elementary teachers. The assessment instrument was used to determine the effect of a sequence of science content courses, the relationship with attitude toward teaching science as measured by the Modified Bratt Attitude Test, the effects of various teachers, the effects of staffing patterns, the relationship among various demographic variables, and the longitudinal effects of subsequent academic experiences. In addition, it may be possible to identify "science anxious" students, and design programs to reduce their anxiety.

MAJOR POINTS OF PRESENTATION

1. The A-State form of the STAI is used to assess transitory emotional states provoked by an individual's perceptions of a specific situation as personally threatening. These experiences produce emotional reactions which characteristically involve increasing feelings of tension, nervousness, worry and apprehension (Spielberger, Gorsuch and Lushene, 1970) For permission to use the STAI contact: Dr. Charles D. Spielberger, Center for Research in Community Psychology, University of South Florida, College of Social and Behavioral Sciences, Human Resources Institute, Tampa, Florida 33620. The STAI has been used in hundreds of studies in the field of psychology. It has only recently been used by science educators. Ralph Mason Dreger (1978) states that this assessment instrument is one of the best, if not the best, measures of anxiety.

2. The directions are very important. The directions for studies conducted by this researcher asked students to respond to each of the questions imagining that they were teaching science for the first time with the knowledge of science they possessed at that moment. With Spielberger's

permission the headingson the STAI were changed, but the instrument was not altered.

3. Repeated administrations of the A-State form can indicate changes in anxiety about teaching science in a specific situation. Figure 1 shows the reduction of anxiety during the 1977-78 and 1978-79 academic years. In the 1977-78 study two teachers were involved in teaching Science 6, a science course in earth science and biology. Each teacher taught her academic specialty, which meant that the teachers "switched" students midsemester. In the 1978-79 study the same two teachers taught both earth science and biology to the same students. Apparently the retention of the same teacher for both academic disciplines was a factor in the reduction of anxiety about teaching science in the 1978-79 study. This pattern was confirmed by the 1979-81 study.

4. This researcher used A-State measurements taken from different samples (1977-78, 1978-79, 1979-80 and 1980-81) of preservice teachers, who were remarkably similar in demographic background, to compare their initial anxiety levels and the reduction of anxiety about teaching science in these samples, during sequences of science content courses.

5. In the 1980-81 study both A-State (transitory) and A-Trait (relatively stable individual differences in anxiety proneness) were taken. By comparison of an individual's A-State and A-Trait scores it is possible to identify subjects who are extremely anxious about teaching science. This may be termed SCIENCE TEACHING ANXIETY.

6. This researcher has examined individual results of many successive administrations of the STAI (544 subjects) over 4 years. Although there is a high standard deviation for group administrations, individual A-Trait scores seldom vary much even after several months between administrations. Individual A-State scores show remarkably reasonable patterns. On a few occassions where individuals have reported extremely stressful events in their lives (accidents, health problems or death of close friends or relatives) fluctations in their A-State scores could sometimes be noted.

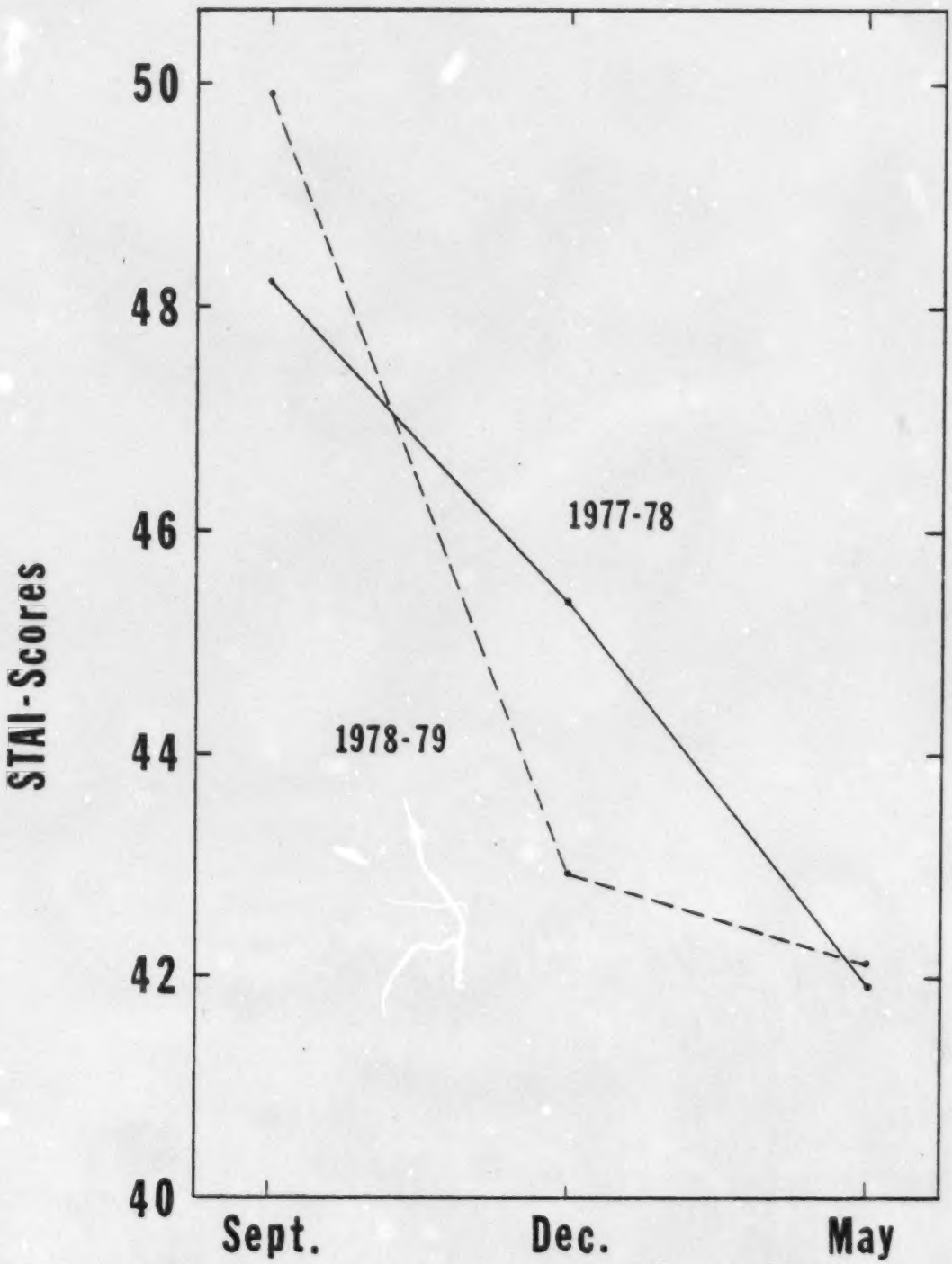
STAI-Scores
50
48
46
44
42
40
Sept.
Dec.
May
1977-78
1978-79

Figure Caption

Figure 1 Mean scores for administrations of STAI during Science 6, an earth science and biology course, (Sept. to Dec.) and Science 5, a physical science course, (Dec. to May) for the 1977-78 and 1978-79 academic years.

7. The 1977-78, 1978-79 and 1980-81 studies used the X Form of the STAI. The 1980-81 studies used a newer form, the Y Form. Correlation Coefficients between the same administration (October 1980) of the State and Trait Measure of the X and Y forms are: .935 for A-State, N=94 and .940 for A-Trait, N=94.

The 1979-80 and 1980-81 studies were supported by a Research Grant from the Research Committee of C. W. Post Center, Greenvale, New York 11548.

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